What is claimed is:

1. A high power Schottky rectifier comprising:

a substrate;

a gallium nitride epitaxial film grown over the substrate including a surface portion of a type that is susceptible to surface breakdown; and

a nitride insulator film, formed over the surface portion to suppress surface breakdown in the surface portion.

2. The high power Schottky rectifier of claim 1, wherein the nitride insulator film is one of an aluminum nitride film and aluminum gallium nitride film.

3. The high power Schottky rectifier of claim 2, wherein the nitride insulator film is an epitaxially grown film.

4. The high power Schottky rectifier of claim 3, further comprising a Schottky contact and an ohmic contact disposed in openings through the nitride insulator film extending to a surface of the gallium nitride epitaxial film on either side of the surface portion thereof susceptible to breakdown.

5. The high power Schottky rectifier of claim 4, wherein the rectifier has a planar cross-sectional area approximately between 1 and 10 cm^2.

6. The high power Schottky rectifier of claim 5, wherein the rectifier has a reverse voltage withstand capability in the approximate range between 5 kVolts and 25 kVolts.

7. The high power Schottky rectifier of claim 5, wherein the rectifier has a current withstand capability in the approximate range between 200 and 2000 Amperes.

8. The high power Schottky rectifier of claim 1, wherein the substrate is sapphire.

9. The high power Schottky rectifier of claim 1, wherein the substrate is a gallium nitride material.

10. The high power Schottky rectifier of claim 1, further comprising a Schottky contact and an ohmic contact disposed in openings through the nitride insulator film extending to a surface of the gallium nitride epitaxial film on either side of the surface portion thereof susceptible to breakdown.

11. The high power Schottky rectifier of claim 1, wherein the rectifier has a planar cross-sectional area approximately between 1 and 10 cm^2.

12. The high power Schottky rectifier of claim 1, wherein the rectifier has a reverse voltage withstand capability in the approximate range between 5 kVolts and 25 kVolts.

13. The high power Schottky rectifier of claim 1, wherein the rectifier has a current withstand capability in the approximate range between 200 and 2000 Amperes.

14. A method of fabricating a high power Schottky rectifier device with high suppression of surface electric field breakdown comprising :

producing a gallium nitride epitaxial film on a substrate; and

growing a nitride insulator film over the gallium nitride epitaxial film.

15. The method of claim 14, wherein said nitride insulator film is one of an epitaxially grown aluminum nitride film and an aluminum gallium nitride film.

16. The method of claim 15, further comprising:

creating first and second openings through the nitride insulator film extending to the surface of the gallium nitride epitaxial film; and

forming a Schottky contact and an ohmic contact in associated ones of the first and second openings.

17. The method of claim 16, wherein the rectifier has a planar cross-sectional area approximately between 1 and 10 cm^2.

18. The method of claim 17, wherein the gallium nitride epitaxial film is grown on a sapphire wafer material.

19. The method of claim 17, wherein the gallium nitride epitaxial film is grown on a gallium nitride wafer material.

20. The method of claim 17, wherein the gallium nitride epitaxial film is grown on an electrically non-conductive wafer material.

21. The method of claim 17, wherein said high power rectifier device is one of multiple high power devices formed on a single wafer material.

22. The method of claim 21, wherein said multiple high power devices includes at least two rectifier devices.

23. The method of claim 21, wherein said multiple high power devices constitute an integrated circuit.

24. The method of claim 14, further comprising:

creating first and second openings through the nitride insulator film extending to the surface of the gallium nitride epitaxial film; and

forming a Schottky contact and an ohmic contact in associated ones of the first and second openings.